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Amendments to the Abstract:

Disclosed are self-hydrating membrane electrode assemblies (MEAs), including MEAs that have been magnetically modified, which comprises (i) a cathode comprising an electrically conducting material having a catalytic material on at least a portion of a first surface thereof, the catalytic material comprising an effective amount of at least one catalyst component and at least one ion conducting material; (ii) a separator adjacent to and in substantial contact with the first surface of the cathode and comprising an ion conducting material; and (iii) an anode adjacent to and in substantial contact with the surface of the separator opposite the cathode and comprising an electrically conducting material having a catalytic material on at least a portion of a surface thereof adjacent to the separator, the catalytic material comprising an effective amount of at least one catalyst component and at least one ion conducting material; wherein the separator permits water to pass from the first surface of the cathode to the surface of the anode in an amount sufficient to sustain hydration of the anode and further wherein the cathode produces sufficient water to sustain hydration of the anode. Also disclosed are ~~and to~~ methods of manufacture of ~~the same~~ the self-hydrating MEAs, as well as fuel cells that require only a self-hydrating MEA and a source of fuel.